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SAA PUBLIC LIGHTING CODE
Part 1—PERFORMANCE AND INSTALLATION DESIGN REQUIREMENTS

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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This Australian standard was prepared by Committee LG/2, Street Lighting. It was approved on behalf of the Council of the Standards Association of Australia on 10 December 1985 and published on 3 February 1986.

The following interests are represented on Committee LG/2:

Australian Automobile Association

Australian Council of Local Government Engineers Associations

Australian Electrical and Electronic Manufacturers Association

Australian National Committee on Illumination

Australian Road Research Board

Confederation of Australian Industry

Department of Housing and Construction

Department of Transport

Electricity Supply Association of Australia

Illuminating Engineering Societies of Australia

National Association of Australian State Road Authorities

National Capital Development Commission

The University of N.S.W., Department of Transport Engineering

Traffic Authority of N.S.W.

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STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

AMENDMENT No 1
to
AS 1158.1—1986
SAA PUBLIC LIGHTING CODE
PART 1—PERFORMANCE AND INSTALLATION DESIGN REQUIREMENTS

CORRECTION

The 1986 edition of AS 1158.1 is amended as follows; the amendments should be inserted in the appropriate place.

SUMMARY: This amendment applies to Clauses 3.3.1.1, 3.3.1.2, 3.3.1.3, Fig. 3.1 and Table 4.2.

Published on 4 May 1987.

AMDT No 1 MAY 1987

Page 14. Clause 3.3.1.1.

Add a new paragraph at the end of the clause as follows:

For the purpose of Clauses 3.3.1.2 and 3.3.1.3, the road width shall be taken as follows:

(a) *For single carriageway roads*—the distance between kerbs.

(a) *For divided roads*—the distance between the outer kerbs.

AMDT No 1 MAY 1987

Page 14. Clause 3.3.1.2.

In the clause title, *delete* '*carriageways*' and *substitute* '*roads*'.

In the first sentence of the first paragraph, *delete* the words 'with carriageways'.

AMDT No 1 MAY 1987

Page 14. Clause 3.3.1.3.

In the clause title, *delete* '*carriageways*' and *substitute* '*roads*'.

In the first sentence of the first paragraph, *delete* the words 'with carriageways'.

AMDT No 1 MAY 1987

Page 15. Fig. 3.1.

Amend Note 1 as follows:

'... spacing required for a straight section of the same road width.'

AMDT No 1 MAY 1987

Page 20. Table 4.2.

For Type 4 luminaires, *amend* the glare control criteria (d) to read:

(d) The luminous intensity at a γ (vertical) angle of 75 degrees, in the C_{90} and C_{270} vertical planes, shall not exceed 150 cd per 1000 lamp lumens.

Rae for information — will send the reply when I receive it.
- I can forsee people enquiring & getting confused
Regards
Eleanor.
86-02-27

STANDARDS ASSOCIATION OF AUSTRALIA

Date 1986-02-27 File No.

Memo. by Eleanor Hall SIC To Ian Wilson

1185 should read 1158·3

Re AS 1185.3 of date

- In the preface to the new edition of AS 1158.1, I notice the old parts 1 and 2 of AS 1158 will not be completely superseded until the new part 3 is issued.

- In the projects file the new part 3 is not expected to reach stage 600 until Sept 1987.

- Is it correct to assume that AS 1158.1 - 1973 and AS 1158.2 - 1971 will run concurrently with the new Parts 1 and 2 of AS 1158 until late 1987 or early 1988 when the new part 3 will be published? Which sections of the old AS 1158 are still current?

Regards,

Eleanor.

A31

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AUSTRALIAN STANDARD

THE LIGHTING OF URBAN ROADS AND OTHER PUBLIC THOROUGHFARES

Known as the SAA PUBLIC LIGHTING CODE

Part 1 PERFORMANCE AND INSTALLATION DESIGN REQUIREMENTS

AS 1185.1—1986

First published as AS CA19 1939
Revised (in part) and issued as AS CA19, Part 1 1964
Revised and issued as AS 1158, Part 2 1971
and AS 1158, Part 1 1973
Revised and issued as AS 1158.1 1986

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
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PREFACE

This standard was prepared by the Association's Committee on Street Lighting. It is one of what is essentially a new series of standards which, although retaining the generic designation AS 1158, supersedes the previous series, i.e. AS 1158, Part 1—1973, Part 2—1971 and Part 5—1974.* Of this previous series it should be noted that Part 3 and Part 4, although foreshadowed, were never prepared.

This standard (designated AS 1158.1) forms Part 1 of the new series which comprises the following standards:

AS 1158.1 SAA Public Lighting Code
Part 1—Performance and Installation Design Requirements

The standard applies to the whole of the urban road hierarchy from major arterial roads, including freeways, to residential streets and certain public thoroughfares, other than roads, which provide for the movement of pedestrians and/or cyclists. A number of lighting categories are described for application to particular types of road or area and appropriate performance and installation design requirements are specified for each category. It also specifies the luminaire and installation design data that must be provided to facilitate lighting design and assessment of compliance with the specified requirements.

AS 1158.2 SAA Public Lighting Code
Part 2—Computer Procedures for the Calculation of Light Technical Parameters for Category A Lighting

The standard specifies the computer-based procedures applicable to Category A lighting for use in the derivation of installation design data or for the direct calculation of light technical parameters to determine compliance with the requirements of AS 1158.1. It describes the use of a computer program, designated SAA STAN, for the calculation of light technical parameters on straight sections of road. The source code for the SAA STAN program (on a 13 cm IBM-formatted flexible disc) is provided with the standard.

AS 1158.3 SAA Public Lighting Code
Part 3—Guide to Design, Installation and Maintenance†

The standard sets out guidelines for the design, installation and maintenance of lighting for roads and public thoroughfares, other than roads, which provide for the movement of pedestrians and/or cyclists. The purpose of the standard is to provide background information and advice to assist in the application of the requirements of AS 1158.1.

AS 1158.4 SAA Public Lighting Code
Part 4—Supplementary Lighting at Pedestrian Crossings†

The standard specifies requirements for a system of floodlighting comprising one or more floodlights mounted above each stream of traffic with the beam(s) pointed in the direction of the traffic flow and downwards towards the pedestrian crossing. It assumes the existence of and is supplementary to road lighting complying with the requirements of AS 1158.1.

AS 1158.1, AS 1158.2 and, when published, AS 1158.3 together supersede AS 1158, Part 1—1973 and Part 2—1971. The three standards collectively represent a major change in the approach previously adopted in the specification of road lighting. Information on the most significant changes is contained in the Foreword to this standard.

AS 1158.4, when published, will supersede AS 1158, Part 5—1974.

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* AS 1158 SAA Public Lighting Code
Part 1—1973 Lighting of Urban Traffic Routes
Part 2—1971 Lighting of Minor Streets
Part 5—1974 Supplementary Lighting at Pedestrian Crossings

† In course of preparation.

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FOREWORD

Work on the revision of AS 1158, Part 1—1973 and Part 2—1971 was undertaken primarily to up-date the requirements in accordance with current practice; impetus being provided by—

(a) the increasing use of computers as a tool for the design and evaluation of road lighting;

(b) developments in light sources and luminaires, especially those designed for use in the lighting of minor roads; and

(c) recent emphasis on the economic and energy aspects of road lighting.

The following principles were adopted for the revision of AS 1158, Part 1—1973 and Part 2—1971:

(i) Lighting requirements should be specified for the whole of the urban road hierarchy in a manner that reflects current road and traffic management practices.

(ii) Lighting requirements should be specified in terms of relevant light technical parameters and their numerical values.

(iii) As far as possible, no requirements should be specified for the light output distribution from luminaires.

(iv) Wherever possible, computer-based procedures should be used for the preparation of design data and design aids.

(v) A range of design methods should be specified which cater for different levels of installation complexity and design expertise.

A major implication of these principles is that manufacturer's products will now be assessed on their individual merits. No longer will all luminaires, regardless of potential performance, be required to conform to a specified light distribution and be mounted at specified maximum spacings. Compliance with the requirements of this standard is assured by manufacturers and designers having to demonstrate that an individual luminaire, mounted at a recommended spacing, will satisfy the requisite light technical parameters, based on the use of one of the specified design methods and photometric data obtained in a prescribed manner.

The specified design methods are primarily luminance based, for roads where the needs of motorized traffic are dominant (Category A lighting), and illuminance based, for roads and other public thoroughfares where the needs of pedestrians are dominant (Category B and Category C lighting). For both Category A lighting and Category B lighting, several alternative design methods are specified for each of the various road elements. Wherever possible, these are computer based but a number of design rules are specified where the use of computer techniques is not appropriate.

For example, for both Category A lighting and Category B lighting, using Method 1 for the design of straight sections of road, the maximum spacings possible for a range of common installation geometries will be provided by the manufacturers for individual luminaires. These data will be in the form of spacing tables for Category A lighting and spacing graphs for Category B lighting, and will be generated using specified computer procedures.

This standard includes a multi-level categorization of lighting which embraces those lighting levels which previously applied for traffic routes and minor roads in AS 1158, Part 1—1973 and Part 2—1971 respectively. However, several additional steps in lighting level are now provided which will be more appropriate for certain classes of road (see Table 1.1).

For the majority of roads, the numerical values of the light technical parameters adopted in this standard are not essentially different from those given or implied in AS 1158, Part 1—1973 and Part 2—1971. For example, the requirements for glare control for traffic route (Category A) lighting are based on the semi-cut-off light distribution classification of AS 1158, Part 1—1973.

The committee undertook a number of studies in the course of the revision. These included appraisals of traffic route and minor road lighting, and a number of computer analyses of lighting.

Road lighting is acknowledged to be an effective accident counter-measure. Studies in Australia and overseas have led to the conclusion that traffic route lighting is likely to reduce night time casualty accidents by about 30 percent, taken over the road network.* However, utility poles, including rigid road lighting poles, are now

* See References 14, 17 and 20 in the Annex.

recognized as being a potential hazard to motorists. * One way of reducing the hazard is to mount luminaires on the inside of curves. A computer study has shown that curves may be successfully lighted from the inside, if this is so desired. † A design method for lighting the curved road element has been developed whereby the necessary closer spacings for both inside and outside mounting will be derived from a curve spacing chart and the spacing applicable to a similar straight section of road.

* See Reference 21 in the Annex.
† See Reference 19 in the Annex.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

THE LIGHTING OF URBAN ROADS AND OTHER PUBLIC THOROUGHFARES

PART 1—PERFORMANCE AND INSTALLATION DESIGN REQUIREMENTS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies performance and installation design requirements which apply to the lighting of urban roads and certain public thoroughfares, other than roads, which provide for the movement of pedestrians and/or cyclists. It also specifies the luminaire and installation design data that must be provided to facilitate the lighting design and the assessment of compliance with the requirements of this standard.

The standard does not apply to the lighting of special situations such as tunnels and toll plazas.

NOTE: AS 1158.2 specifies the computer-based procedures applicable to the design of Category A lighting. AS 1158.3 sets out guidelines for the design, installation and maintenance of all categories of lighting for which requirements are specified in this standard. AS 1158.4 provides requirements for the floodlighting of pedestrian crossings. See the Preface to this standard for further information.

1.2 LIGHTING CATEGORIES AND THEIR APPLICATION. For the purpose of this standard the lighting categories specified in Table 1.1 shall apply. Table 1.1 also describes typical applications for each of the specified lighting categories.

NOTE: The lighting categories specified in Table 1.1 are broadly divided as follows:

(a) *Category A lighting.* Lighting which is applicable to roads on which the visual requirements of motorists are dominant, e.g. arterial roads.

(b) *Category B lighting.* Lighting which is applicable to roads on which the visual requirements of pedestrians are dominant, e.g. minor roads.

(c) *Category C lighting.* Lighting which is applicable to public thoroughfares, other than roads, where the visual requirements of pedestrians are dominant, e.g. outdoor shopping precincts.

1.3 REFERENCED DOCUMENTS. A list with titles of the standards and other documents referred to in this standard is given in the Annex. The Annex also lists several additional documents which are considered useful sources of information on the subject of this standard.

1.4 DEFINITIONS. For the purpose of this standard, the following definitions apply.

NOTES:

1. The definitions in this Clause which refer to various road elements comply with those given in AS 1348.1 or are based upon them.
2. The light technical parameters for Category A lighting are defined in more precise mathematical terms in Section 2 of AS 1158.2.

1.4.1 Arrangement (lighting arrangement)—the pattern according to which luminaires are sited in plan, e.g. single sided, staggered, opposite or central.

1.4.2 Average carriageway luminance ($\bar{L}$)—the mean luminance over a specified section of carriageway, viewed from a specified observer position.

1.4.3 Average illuminance ($\bar{E}$)—the mean illuminance in a horizontal plane at ground level over a specified area, derived in a specified manner.

1.4.4 Azimuth angle—see Clause 1.4.5.

1.4.5 *C* angle—the angle between the vertical plane containing the direction of a particular value of intensity and the vertical plane parallel to the axis of the road.

NOTE: See Fig.1.1 for details of the *C*, γ angular coordinate system which is used for the photometry of luminaires for road lighting.

1.4.6 Carriageway—that portion of the road devoted particularly to the use of vehicles, inclusive of shoulders and auxiliary lanes.

1.4.7 Carriageway width (W_K)—the width of carriageway, determined in accordance with this standard, which is used for the calculation or assessment of road lighting.

1.4.8 Channelized intersection—an intersection provided with medians and islands for defining the trafficable area and to control specific movements.

1.4.9 Disability glare—glare that impairs the visibility of objects without necessarily causing discomfort.

1.4.10 Discomfort glare—glare that causes discomfort without necessarily impairing the visibility of objects.

1.4.11 Discomfort glare control mark (*G*)—a measure of the discomfort glare evaluated in a specified way on a scale of 1 to 9; the higher numbers corresponding to greater glare control.

1.4.12 Downward light output ratio—the ratio of the total luminous flux emitted by a luminaire below the horizontal, to that emitted from the light source.

1.4.13 Divided road (dual carriageway road)—a road having a separate carriageway for each direction of travel.

1.4.14 Footpath (pathway)—a public way reserved for the movement of pedestrians and of non-motorized vehicles.

1.4.15 Flashed area (*F*)—the luminous area of a luminaire used for the purpose of evaluating the discomfort glare control mark (*G*) and the specific luminaire index (*SLI*).